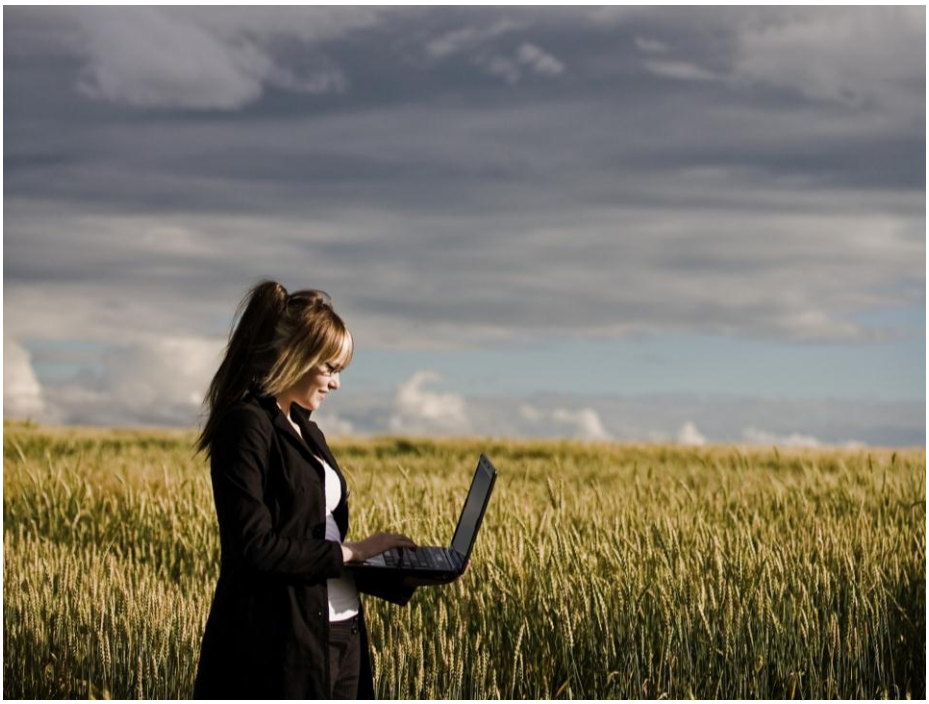
Broadband *KY*

East Kentucky Profile

Utilizations and Impacts of Broadband
for Businesses, Organizations and Households



This report was prepared by Strategic Networks Group in partnership with Michael Baker Jr., Inc.

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Prepared for:
Commonwealth of Kentucky Office of Broadband Outreach and Development

COMMONWEALTH OFFICE OF BROADBAND OUTREACH AND DEVELOPMENT
Promoting a 21st century economy

BROADBAND KY

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This report is one of several deliverables that are part of the Kentucky Broadband Project of the Commonwealth Office of Broadband Outreach and Development (OBOD), and managed by Michael Baker Jr., Inc. (Baker). Ongoing project reporting, outreach, field work, surveys, data analysis and development and map production incorporate information relating to the Commonwealth's Broadband availability, utilization and adoption in specific regions, including characteristics such as service provider data and coverage areas, industry and business data, and household demographics. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009; funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period from 01/01/2010 to 12/31/2014.

For certain project components, Baker contracted with Strategic Networks Group (SNG) to administer user surveys, and to tabulate, analyze and develop reports based on the collected survey data. The Project Area Profile on the following pages was prepared by Strategic Networks Group under contract to and in partnership with Michael Baker Jr. Inc.

This report is the second of two companion documents:

1) The Kentucky e-Strategy Report provides a state-wide analysis of utilization of the Internet. This state-wide perspective highlights trends that impact all regions to some degree. The report includes a comparative analysis of the Internet across the five regions of Kentucky: East, Central, West, North and Northeast. (See appendix for list of counties within each of the five regions).

2) The second set of documents consists of profiles for areas undertaking broadband planning initiatives in collaboration with the Kentucky Office of Broadband Outreach and Development (OBOD) and the Kentucky Council of Area Development Districts (KCADD). Recommendations from the Kentucky e-Strategy Report are reproduced in section 2 of each area profile, thereby providing a state-wide framework for local and regional broadband planning.

In addition to the documents noted above, the Office of Broadband Outreach and Development and the Kentucky Association of Area Development Districts can access an online platforms that include databases on Internet use and impacts, as well as the underlying broadband infrastructure. These online platforms can provide customized reports on specific issues for defined geographic areas or sectors.

The area profiles focus on the specific opportunities and gaps for five geographic areas: Central Kentucky (Lincoln Trail, Lake Cumberland and Barren River Area Development Districts), **East Kentucky (Big Sandy, Cumberland Valley and Kentucky River Area Development Districts)**, Northeast Kentucky (Buffalo Trace, Gateway and FIVCO Area Development Districts), Purchase Area Development District, and North (KIPDA and Northern Kentucky, excluding Jefferson County).

In each of the geographic areas that are profiled, a broadband planning initiative is being undertaken on an issue specific to that region. In the East Region, that issue is improving local

government use of the Internet as part of a strategy to engage local residents and provide compelling reasons for them to "get online". Section 4.3 of this profile provides data and analysis specifically on local government use of the Internet within the East region. The other parts of this report include:

- ***Sections 1 & 2: Background and Recommendations.*** These two sections provide a state-wide perspective of issues related to broadband adoption and utilization. Section 2 includes Kentucky wide recommendations that provide a framework for local and regional broadband planning and efforts.
- ***Section 3: Starting Points***. This section introduces basic concepts required for comparative analysis of broadband use in regions and sectors across Kentucky.
- ***Section 4***: Project Area Profile. This section includes data and analysis specific to the project area – in this case the East Region.

Those interested in a more detailed exploration of regional performance in broadband utilization are strongly encouraged to contact staff from OBOD and KCADD.

1. Background, Summary and Recommendations

Many communities and regions across Kentucky face significant challenges, among them economic dislocation and an aging population. Most rural areas face the additional challenge of population shifts from rural to urban areas. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (essentially high-speed Internet access), which can be leveraged into tangible benefits for communities, businesses and households. Businesses can become more productive, competitive and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Kentucky is based on data collected in February and March 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

Utilizing Broadband

The ability to utilize or leverage broadband varies significantly across businesses, organizations and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support, all in addition to access to broadband availability.

In those industry sectors and communities that already have a large, diverse and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses and households have limited Internet related skills and capacity. For these groups, even with state-of-the-art connectivity, leveraging broadband often lags. The consequence is that these communities (and households and businesses) lose out on many of the benefit of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in East Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how industry sectors and household types in East Kentucky compare to each other and to statewide patterns. The report provides insights and hard evidence that allow communities, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits.

The report includes statewide recommendations for how the Commonwealth of Kentucky and its regions can improve the utilization of broadband, thereby improving their economies and quality of life. Recommendations are broken down into three areas: gaps and opportunities where regions are lagging in their use of the Internet and broadband; key barriers to improving the use and benefits of Internet and broadband; and the best ways to build skills and abilities. Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into five distinct regions of Kentucky: North, Northeast, East, West, and Central. The composition of these five regions is outlined in Appendix 1.

*This report uses data collected in February through April 2012 across Kentucky. A total of 2,231 organizations and 4,122 households contributed to the state-wide broadband benchmarking effort. The sample for East Kentucky is 279 organizations and 455 households.**

* A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband KY* e-Solutions Benchmarking Technical Report (May 2012). The number of responses collected in this analysis is substantial, especially when compared to national polls.

2. State-wide Recommendations

To assist stakeholders and communities to better understand and use this report, the recommendations of the Kentucky e-Strategy Report were structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

1. How important is high-speed Internet access to Kentucky, its communities and its residents?

In the twenty-first century, high-speed Internet access has been an essential part of a region's infrastructure, a business's internal and external operations, and a household's participation in their community life. Availability and meaningful use of high-speed Internet access speaks directly to a community's viability, competitiveness and quality of life. However, each region and community has its own unique characteristics, assets and challenges. Current Internet usage and opportunities for development vary widely, as explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation. The Commonwealth can provide support, but social and economic developments are essentially local and regional in nature.

Over 19% of households would "definitely" relocate to another community for broadband service if it was not available to them in their current location. Another 20% would consider relocation "very likely". Broadband was also considered "essential" for selecting location by 36% of businesses and other organizations, as well as "essential" for remaining in location by 59% of organizations. **Benchmarking Data for Kentucky, May 2012.**

Recommendation #1: *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values and priorities.*

2. Where are the major gaps or weaknesses in utilization of the Internet?

Prioritizing industry sectors and other economic groups must be done within a regional context. Additional factors and considerations exist within each region, such as key industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

Key gaps in Internet utilization are focused on household income, age, and skill level, degree of "rurality", and organizational size and industry sector.

Recommendation #2: *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

3. How do we use the potential of the Internet to maximize job creation?

Small to medium sized organizations should be a focus for all regions. This segment is important for the following reasons:

- Includes 95% of all establishments and 43% of all employment in Kentucky
- Has the lowest or weakest utilization levels compared to organizations with larger numbers of employees
- Is a dynamic engine for employment growth, especially through use of the Internet
- Has the least capacity and expertise to adopt more sophisticated and productive Internet applications

Recommendation #3: *Focus on the small-medium enterprise segment, especially 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues and job creation.*

4. In what areas do small to medium sized business need help?

Broadband KY e-Solutions Benchmarking (eSB) identifies which types of Internet enabled applications and processes are relatively easy or hard to adopt, especially by small to medium sized organizations. Using data on barriers to adoption, action plans can be defined at the regional level to address target groups. Note: e-solutions is the term used in this report refers to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. e-solutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

Recommendation #4: *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation*[1]
3. *Teleworking*
4. *Staff training and skills development*
5. *Advertising and promotion*
6. *Social networking*
7. *Government transactions*
8. *Customer service and support*
9. *Selling goods or services*
10. *Supplier communication and coordination*

[1] Rich media describes Web pages that use advanced technology such as streaming video, downloaded programs that interact instantly with the user for advertising.

5. How can we reach households that have not adopted the Internet or use it only minimally?

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 and households with lower incomes.

> The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.

Recommendation #5: *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

6. Is it true that the rural areas have a particularly hard time in adopting and using the Internet?

Yes! While both urban and rural households struggle to use and benefit from the Internet, rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Non-metropolitan areas with significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficultly in accessing educational, health and government services, all of which are increasingly available online.

Recommendation #6**:** *Non-metropolitan areas are a priority for Internet training programs and resources.*

Rather than trying to entice target populations into existing programs (such as classroom courses), Internet training initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

7. How can we help citizens of Kentucky make better use of the Internet?

Rather than trying to entice target populations into existing programs (such as classroom courses), e-solution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

Recommendation #7: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

The preferred learning methods of 47% of those over 65 in Kentucky are "talking to others" and "online information". The least preferred learning methods were "workshops" and "classrooms courses" (preferred by 16%).

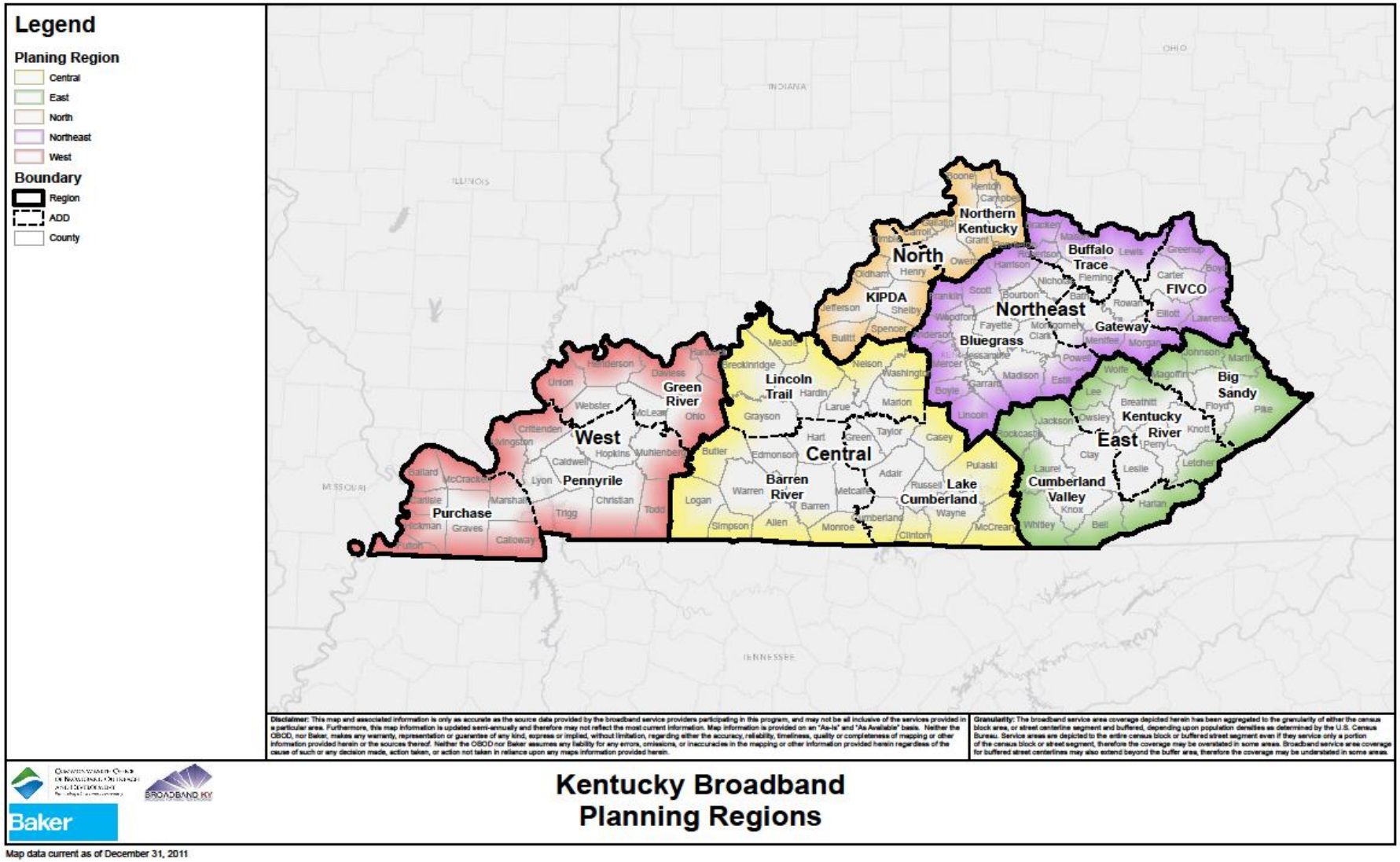
8. How can those who do not use the Internet be assisted to start using the Internet in ways that produce tangible benefits?

Approximately one in five individuals in Kentucky does not use or benefit from the Internet. The largest group of non-Internet users are those 65 years and older. However, lower income households also have significantly lower rates of Internet adoption.

Barriers to Internet adoption vary significantly by type of household. Almost half of non-adopting older households see little value in the Internet, while generally being less skilled in use of computers and Internet. Working age individuals tend to have better computer and Internet skills, but find having Internet at home too expensive. These working age 'non-adopters" are more likely to have children at home and have at least one other person in the household who uses the Internet. These working age households are less likely to be completely isolated from the Internet.

Recommendation #8: *Broadband adoption programs should focus on those key groups that face persistent barriers to adoption, specifically elderly households and lower income households where no-one else in the household uses the Internet. Internet adoption programs should be design to address specific barriers facing their targeted group.*

Figure 1: Kentucky Regions



3. Starting Points

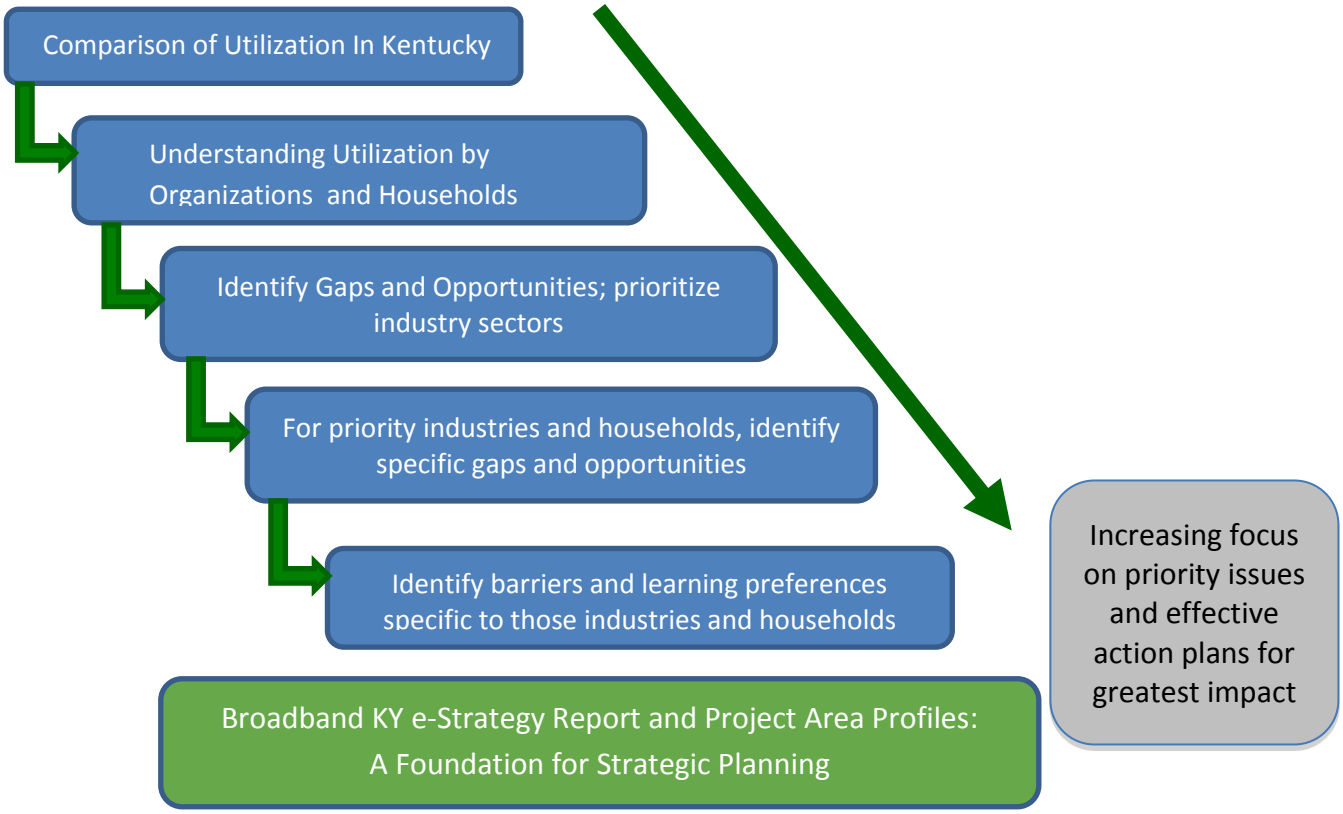
3.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines steps used in this report to move from descriptive data to detailed analysis of targets, priorities and strategies. The ultimate goal of the analysis of broadband in Kentucky is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree;
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps; and,
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

For those interested in a more detailed exploration of regional performance in broadband utilization, you are strongly encouraged to contact regional outreach staff from the Kentucky Office for Broadband Outreach and Development.

Leveraging Broadband for Economic and Social Development

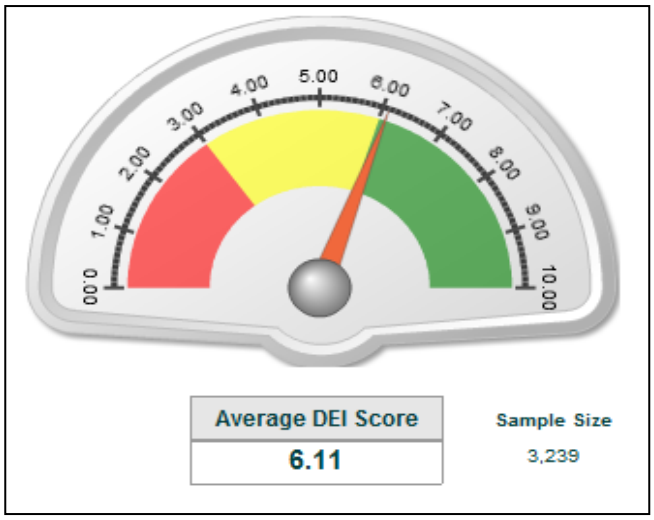


3.2 Introducing the Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization's or household's utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (e-solutions) are listed on the following pages. Based on the number of applications currently being used by an organization or household, a composite score is calculated that summarizes how comprehensively each organization or household uses Internet-enabled e-solutions. The DEi can be used to compare organizations, regions, or industry sectors. A separate DEi is used to compare how different types of households use the Internet.

An organization's or household's DEi score (from 0 to 10) captures that their utilization of e-solutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector's DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.



DEi Meter from dashboard of the Digital Economy Analytics Platform.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.

The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (**green**) to lowest (**red**) to highlight how DEi scores compare. **The color coding** (**green** to **red**) allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

Different DEi comparisons can be useful for different purposes, for example:

- Individual organizations can compare their DEi score with a benchmark average DEi score for their industry in their region. This can provide insights into how well an organization is performing in terms of Internet use compared to their peers.

- Broadband planners and economic development agencies can compare DEi benchmarks between different organization characteristics, such as industries and business sizes, to gain insights into relative utilization levels to aid in targeting low utilization groups. They can also compare DEi benchmarks on a regional basis to aid in planning.
- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

e-Solutions refer to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. e-Solutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

e-Solutions Categories for Households	
Communication	***Transactions***
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
Productivity	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	***Research***
Recreation	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

e-Solutions Categories for Organizations	
e-Commerce Related	***e-Process Related***
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

4. Project Area Profile: East Kentucky

This section provides a profile of Internet utilization in the East Region, consisting of the Big Sandy, Kentucky River and Cumberland Valley Area Development Districts. Most of the material is taken from the Kentucky e-Strategy Report and consolidated into one area-specific profile.

For context in prioritizing regional planning activities it is important to consider the overall profile of the population and economy of East Kentucky.

Figure 2: Demographic and Economic Profile

Households	East	Kentucky
Population	505,473	4,339,367
Median Household Income	$28,721	$40,061
% in Poverty	30.4%	18.4%
% of Population 65+	13.8%	13.3%
Organizations		
Establishments	8,764	90,511
Employment	124,173	1,480,658
Annual Payroll (in billions)	$3.97	$51.44
Average Size of Employer	14.2 employees	16.4 employees
USCB County Business Patterns 2009		

The East region has significantly below average (median) income and an similar age profile compared to the State. Incidence of poverty in the East Region is 65 per cent higher than Kentucky as a whole. At 19 percent of employment and 22.2 per cent of payroll, the health care and social assistance sector plays a large role in the East region. The mining sector is a key differentiator in the East Region, providing 11 per cent of payroll, though only 4.3 per cent of establishments in the region belong to the mining sector. The eight largest industries, ranked by annual payroll, that collectively represent over 70 percent of the economy in East Kentucky are:

Figure 3: Largest Economic Sectors in East Kentucky

Rank	Industry Sector	Percent Employment
1	Health Care & Social Assistance	19.0%
2	Retail Trade	17.7%
3	Mining	11.1%
4	Accommodation & food services	9.3%
5	Manufacturing / Processing	5.9%
6	Professional & Technical Services	3.6%
7	Transportation & Warehousing	3.4%
8	Construction	3.1%
	% Employment	73.1%

% of Payroll	74.6%	% of Establishments	70%

Figure 4: Age Profile of East Kentucky

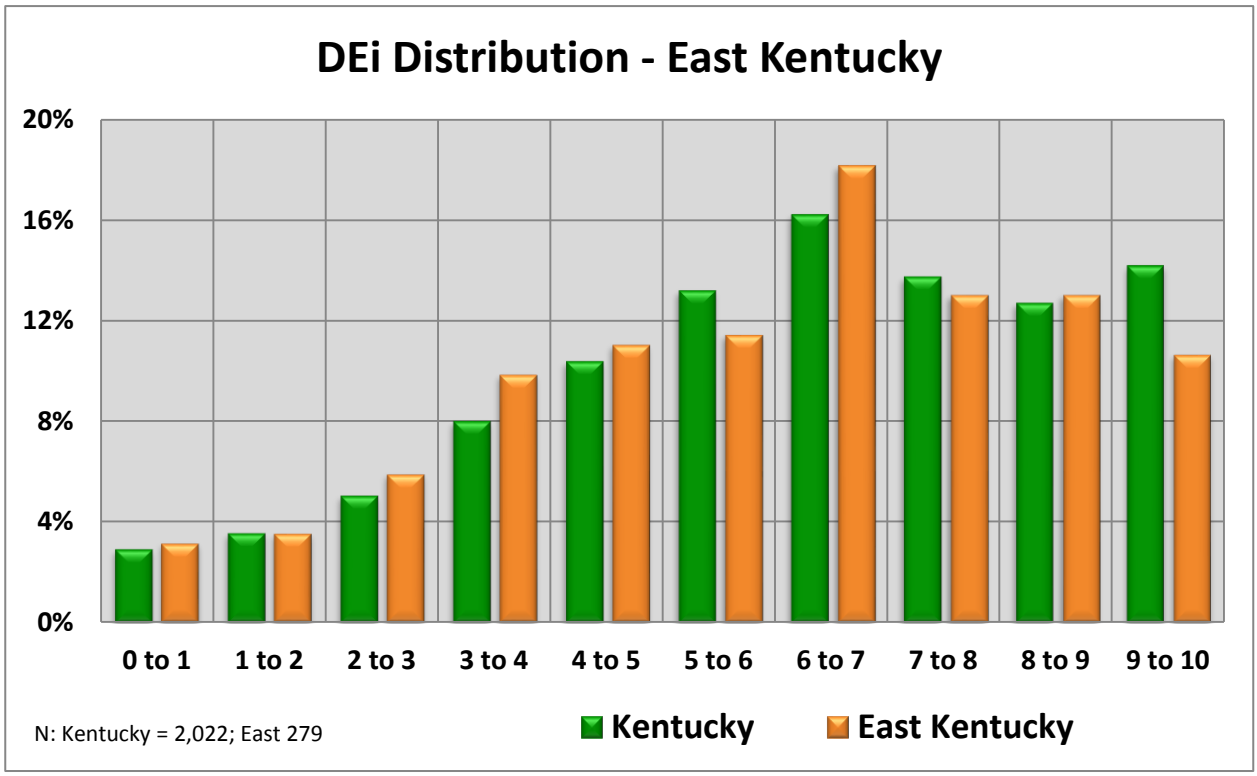
Age Distribution of Adults	East	Statewide
18 to 34 years	21.1%	22.6%
35 to 49 years	21.3%	20.7%
50 to 64 years	21.1%	19.8%
65 years and over	13.8%	13.3%

4.1 Utilization by Organizations in East Kentucky

Internet utilization by organizations in East Kentucky is moderately lower than the state average. The overall Digital Economy Index (DEi) for East Kentucky is 6.21 compared to the statewide DEi of 6.41. This ranks East Kentucky last out of the five regions. The profile of utilization levels from low (1) to high (10), mimics statewide patterns.

Median DEi Score		
Kentucky	East Kentucky	Ranking by Region
6.41	6.21	5

Figure 5: Range of Internet Utilization by DEi



There are significant differences in how various industries utilize the Internet. One of the most important of these is the size of an organization, which impacts an organization's ability to adopt and benefit from more difficult e-solutions. Smaller organizations have lower levels of Internet utilization as can be seen in the following table:

Figure 6: Internet Utilization by Employment Size: East Kentucky

Organizations by Number of Employees	Kentucky DEi (Median)	East Kentucky DEi (Median	Sample Size East Kentucky
1 to 4	5.83	5.73	112
5 to 49	6.41	6.07	110
50 to 99	6.8	6.41	18
100 or more	7.38	8.06	36
All Size Ranges	**6.41**	**6.21**	**276**

Smaller organizations have significantly lower DEi, creating a marked opportunity to increase utilization levels. This is particularly relevant since organizations with 1 to 49 employees comprise over 95 percent of all organizations in East Kentucky.

Figure 7: Share of Labor Force by Size of Organizations

Number of Employees	East Kentucky
1 to 19	86.4%
20 to 49	9.2%
50 to 99	2.1%
100 to 499	2.1%
500 or more	0.2%

It is very informative to look at which industry sectors in East Kentucky vary in their Internet utilization levels from state-wide averages and how they compare to the other four regions. The following industries show relative **strength or weakness within East Kentucky** in terms of Internet utilization levels based on DEi and how that sector compares to other regions in Kentucky. The ranking of industries across regions is particularly informative, since this tracks competitiveness and relative performance.

Figure 8: Strong and Weak Utilization by Industry Sectors

Region	Strong (High DEi or Ranking)	Weak (Low DEi or Ranking)
East Kentucky	• Finance and Insurance	• ***Public administration*** • ***Professional & Technical Services*** • ***Wholesale trade*** • Information Services

The following table summarizes utilization for major industries within East Kentucky (according to DEi scores) and compared to the state average, as well as the region's ranking among the five regions.

Figure 9: Summary of Utilization Levels by Industry Sector

Major Industry Category	Statewide	East Kentucky	Rank Compared to Other Regions
Finance & Insurance	7.5	7.77	2
Information	6.9	6.37	4
Educational Services	6.7	6.45	5
Manufacturing / Processing	6.6		
Retail Trade	6.4	6.02	4
Other services (exc. public admin)	6.3	6.51	3
Professional & Technical	6.2	5.67	4
Wholesale Trade	6.2	4.95	5
Construction	5.8		
Health Care & Social Assistance	5.7	5.87	2
Public Administration	5.2	4.47	5

4.1.1 Opportunities and Gaps Based on Utilization

The following is a list of industries that show the largest gaps in utilization for East Kentucky, grouped into 2 gap level categories. Everything else being equal, the largest gaps present the greatest opportunity to increase utilization. Prioritization should also consider industry size and growth potential. In East Kentucky areas that have the greats gaps in utilization, while also being growth sectors, are: Professional and Technical Services , Information Services and Wholesale Trade.

Figure 10: Gaps and Opportunities for Increasing Utilization by Industry Sector

Major Industry Category	East Region Variation from State Average	Sector Size - Rank	Growth Expectation
Health Care & Social Assistance	0.14	1	↑
Retail Trade	-0.12	2	↑
Mining		3	↓
Manufacturing / Processing		5	↑
Professional & Technical Services	-0.57	6	↑↑
Construction		8	↑↑
Wholesale Trade	-1.27	9	↑
Finance & Insurance	0.3	10	
Information	-0.53	13	↓
Public Administration	-0.7	n/a	
Gap 1 (0.6 or more below the state DEi)	2		
Gap 2 (0.6 to 0.3 below statewide DEi)	2		

**To assess growth potential, this profile uses projections made by Moody Analytics. The arrows in the right column indicate projected growth or decline. The double green arrows indicate areas with significantly higher growth expectations.*

4.1.2 Barriers to Utilization

Barriers to utilization are those factors that tend to inhibit or prevent effective adoption of Internet-enabled applications. Barriers for organizations in East Kentucky are similar to the rest of Kentucky, with privacy, slow Internet, high cost of development and maintenance, and lack of internal expertise the most frequently cited.

Figure 11: Barriers to Adopting Internet Applications and Processes

Barriers to e-Solutions - % Saying Important	East	Statewide
Privacy concerns	71.4%	71.4%
Available Internet is too slow	62.0%	59.2%
High cost of development/maintenance	48.3%	45.8%
Lack of internal expertise and knowledge	48.3%	45.8%
Loss of personal contact with clients	47.4%	45.1%
Suppliers not ready	43.2%	41.5%
Uncertain about benefits	28.2%	28.7%
Security concerns	27.4%	28.7%
Internal organization resistance	23.9%	24.6%
Products not suited to Internet sales	20.1%	24.9%

4.1.3 Impacts from Increasing Utilization

Increased utilization by organizations results in increased revenue and job creation. Increasing an organization's DEi by 1.0 is roughly equivalent to adopting two new utilizations, preferably in more sophisticated types of utilizations that tend to be adopted by high utilization organizations. The increased revenues can take one or two years to materialize, but would directly increase regional GDP and have additional indirect and induced effects on the regional economy.

New jobs would also be created from growing businesses. While total job growth is difficult to predict and is not exclusively driven by Internet utilization, e-solutions benchmarking data for Kentucky show that 34.3 percent of new full-time jobs were attributed to commercial businesses' use of the Internet. Results reported by commercial enterprises in East Kentucky were more modest at 16.6 percent.

Figure 12: Job Creation and Internet Use in Commercial Enterprises

Region	Total Employees	New Jobs Created*	New Jobs Attributed to Internet	% of New Jobs Attributed to Internet*	Number of Reporting Establishments
East Kentucky	1,576	145	24	16.6%	43
Kentucky	15,657	1,731	593	34.3%	401

4.2 Households in East Kentucky

Utilization of the Internet by households in the East Kentucky is slightly lower than the state average. The overall Digital Economy Index (DEi) for households in East Kentucky is 5.95 compared to the statewide DEi of 6.1.

Figure 13: Utilization by Households: DEi Score and Regional Ranking

	Average DEi Score	Rank	Difference from Average	Households in Sample
East Kentucky	5.92	**5**	-.18	455
Statewide	6.1			4,122

4.2.1 Demographic Effects on Utilization

There are a number of factors that contribute to lower household utilization in East Kentucky. With a slightly older and less affluent population, it is no surprise that East Kentucky has households with lower than average computer skills and lower than average utilization. In general, Internet utilization is lower for older age groups and for lower income groups. Utilization levels are also directly proportional to computer skill levels which in turn are associated with older age and lower income groups.

Figure 14: Impact of Age and Income on Internet Utilization

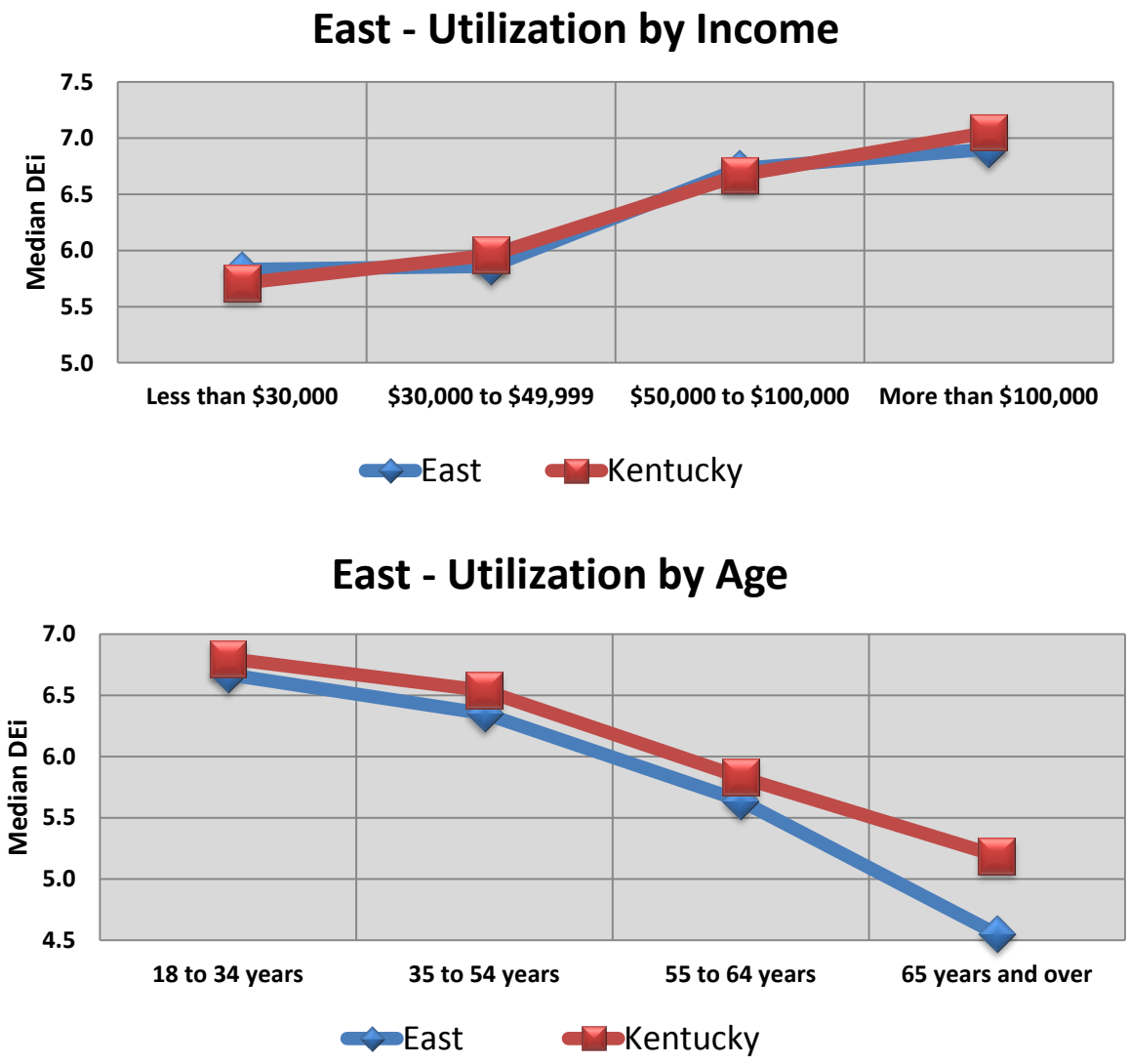
East Kentucky	Household Income			
Respondent Age	Less than $30,000	$30,000 to $49,999	$50,000 to $100,000	More than $100,000
18 to 34	**5.98**	**6.59**	**7.23**	**6.87**
35 to 54	**5.47**	**5.99**	**6.59**	**6.36**
55 to 64	**4.72**	**5.89**	**5.34**	**5.39**
65 years and over	**4.94**	**3.82**	**4.94**	**5.86**

Figure 15: Computer Skill Levels

	Expert user	Use computers with confidence	Know the basics
East Kentucky	24.0%	60.4%	15.4%
Statewide	25.6%	59.9%	14.1%

For East Kentucky, 15.4 percent of households "know only the basics" in computer skill. East Kentucky households face the same statewide issues of relatively low utilization by those over 55, with lower incomes and poor computer skill level. As a factor that can be addressed through broadband support initiatives, targeting computer skill development at these groups is a clear priority and likely to have the greatest impact on increasing utilization and consequently on the ability of households to earn income and access government services.

Figure 16: Internet utilization Levels by Age and Income



4.2.2 Use of Internet for Productivity

In terms of productivity, households in the East region show below average utilization for home businesses and teleworking, but above average utilization for training and education.

Figure 17: Percentage of Households Using the Internet for Productivity

East Kentucky	% Currently Engaged In	Statewide Average	Variance from State Average
Accessing workplace	56.2%	55.6%	+0.6%
Home business	17.0%	20.8%	-3.8%
Teleworking	16.7%	20.8%	-4.1%
Education or training	50.5%	45.9%	+4.6%

4.3 Focus on Project Area Priorities

The East Region has identified local government utilization as its priority focus. Consequently, this profile provides some insights into the performance of municipal and county governments. Sixty nine municipal and 50 county entities participated in the survey across Kentucky. Fourteen local governments from the East Region participated. Readers should keep in mind that the sample sizes for municipal and county governments are relatively small and should be used with caution. Nonetheless, the data on this priority area are suggestive and worth consideration.

Comparative analysis of how local governments use the Internet includes both generic Internet uses and uses specific to local government. The generic uses are measured through the same DEi as for all other organizations and businesses in Kentucky. A separate measure labeled DEi-G was created to compare use of the twelve additional e-solutions with specific relevance to local governments. Performance on nine of these twelve e-solutions can be found in Figure 20 later in this section.

Generally local governments have low levels of utilization of generic Internet applications and processes, with an average DEi of 5.32 compared to 6.42 for K-12 schools and 6.22 for organizations in Kentucky overall. Local governments in metropolitan areas (populations in excess of 50,000) have noticeably higher utilization of both generic e-solutions and government specific e-solutions, when compared to entities outside metropolitan areas. Moreover municipal entities areas have higher utilization than county entities.

Figure 18: County and Municipal Government - Utilization Characteristics

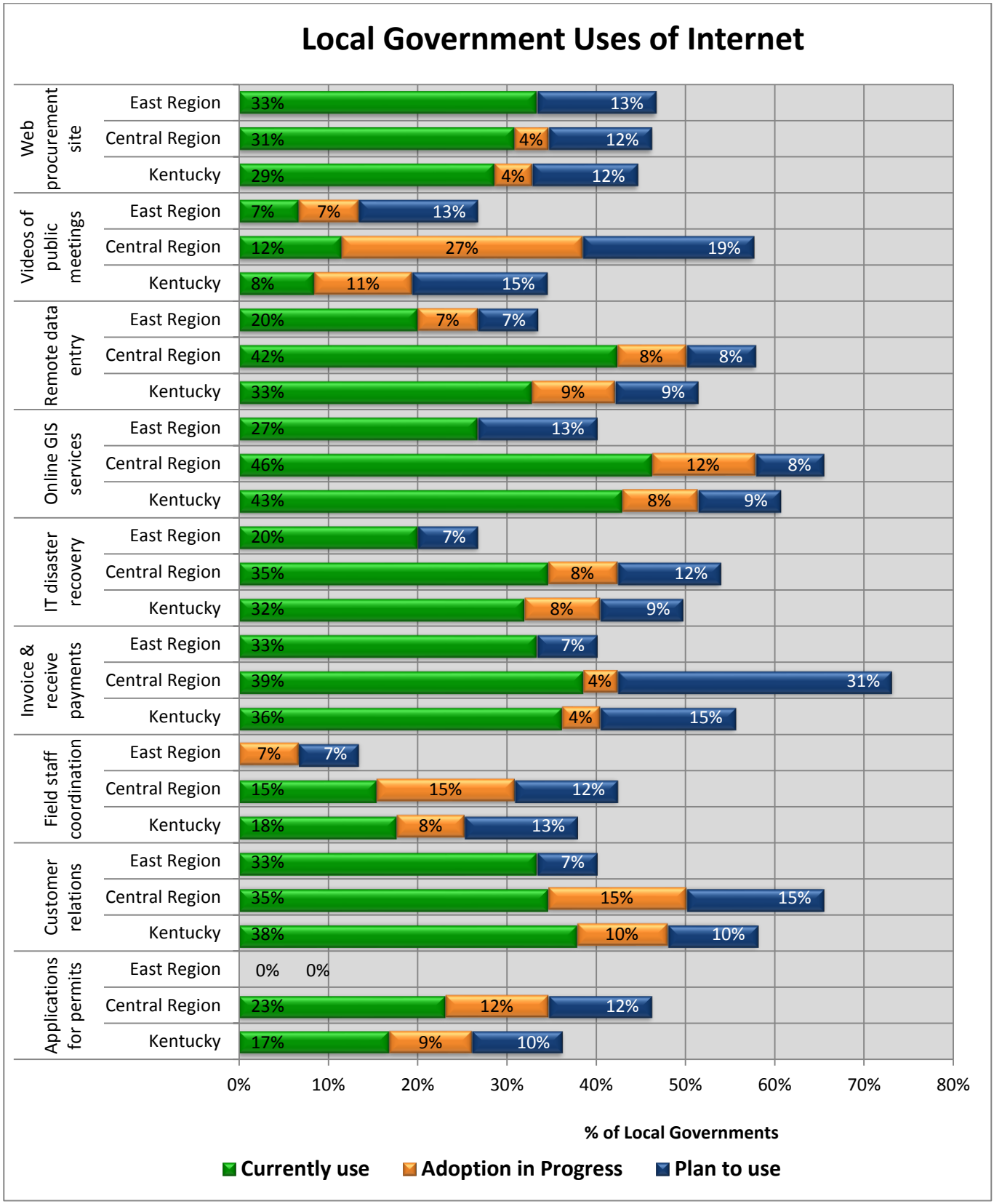
Utilization by Location and Type of Local Government		
Type of e-Solutions	Generic	Local Government Specific
	DEi	**DEi-G**
Municipal	*5.54*	*4.60*
County	*4.79*	*4.48*
Metropolitan	5.81	5.03
Non-metropolitan	4.93	4.38

Comparing regions, local governments in the East Region stand out as having the lowest utilization of e-solutions. Figures 19 and 20 compare the East Region to Kentucky overall, as well as to the Central Region. Local governments in the Central Region have high use of e-solutions, while also having socio-economic similarities to the East, thereby making a good basis for comparison.

Figure 19: County and Municipal Government - Utilization by Region

Utilization by Region by Type of e-Solutions		
	Generic e-Solutions	Local Government Specific
	DEi	**DEi-G**
Central	5.22	5.10
KY	5.19	4.55
East	4.51	3.08

Figure 20: Nine Local Government Uses of the Internet – Regional Comparison



As seen in Figure 20, the East Region has a far lower level of utilization of a number of specific Internet enabled processes and applications. While caution is required due to the small sample size, the data does suggest that local government entities in the East Region should look closely at how other local government entities are utilizing and benefiting from the Internet.

One approach that may be of particular interest to the East Region is growing use of collaboration and shared services among jurisdictions. This approach can compensate for a lack of internet staff resources, as well as restricted development and operating budgets. The contrast between the Central Region and the East Region in terms of collaboration is striking, with a number of entities in the Central Regional having already collaborating on shared services, with more actively considering such a step. In contrast, none of the East Region local government entities that participated in the survey are using or even actively considering shared services.

Figure 21: County and Municipal Government - Utilization Characteristics

Plans for shared services with other jurisdictions					
	Already collaborating	Actively considering	Considered & chose not to	Have not considered	Don't know
East	0.0%	0.0%	13.3%	26.7%	60.0%
Central	24.0%	12.0%	12.0%	28.0%	24.0%
Kentucky	9.4%	6.8%	10.3%	35.0%	38.5%

Appendix 1: Breakdown of Regions by County

East	County	Population	Median Income	% in Poverty	Incidence of 65+
Big Sandy	Floyd	39,451	29,725	30.3%	13.6%
	Johnson	23,356	32,063	22.9%	14.1%
	Magoffin	13,333	26,815	31.7%	12.9%
	Martin	12,929	25,825	45.0%	11.1%
	Pike	65,024	32,258	25.8%	13.7%
		154,093	***31,343***	***28.3%***	***13.4%***
Cumberland Valley	Bell	28,691	24,501	36.0%	15.7%
	Clay	21,730	22,255	43.3%	12.1%
	Harlen	29,278	26,356	33.4%	14.3%
	Jackson	13,494	25,634	30.7%	13.8%
	Knox	31,883	22,493	38.6%	14.6%
	Laurel	58,849	36,664	21.5%	12.9%
	Rockcastle	17,056	29,654	25.0%	14.8%
	Whitley	35,637	26,145	33.3%	14.3%
		236,618	***26,713***	***32.7%***	***14.0%***
Kentucky River	Breathitt	13,878	23,863	32.0%	13.4%
	Knott	16,346	29,375	23.7%	13.2%
	Lee	7,887	23,791	36.8%	13.2%
	Leslie	11,310	26,767	30.8%	14.2%
	Letcher	24,519	29,835	30.6%	14.2%
	Owsley	4,755	21,177	41.1%	16.8%
	Perry	28,712	29,660	27.7%	13.4%
	Wolfe	7,355	25,203	33.0%	15.6%
		114,762	***$26,209***	***32.0%***	***13.9%***

Appendix 2: Glossary

***Broadband KY* e-Strategy Report:** This report examines how organizations and households in Kentucky differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how different industry sectors and household types compare to each other, especially between and within regions. The report provides insights and hard evidence that allows regions, businesses, and households to assess where they stand. The report provides recommendations on strategies for improving their Internet performance and benefits.

***Broadband KY* e-Solutions Benchmarking Technical Report:** This report presents the results of survey-based research carried out for the Commonwealth of Kentucky. The surveys collected information from businesses, organizations and households on the availability of broadband (high speed Internet access) and its uses, benefits, drivers and barriers. This largely descriptive report results provide insight into gaps and opportunities for increasing broadband utilization by organizations and households. The policy, planning and program implications for Kentucky and its regions are dealt with in a separate report: the *Broadband KY* e-Strategy Report.

Digital Economy Analysis Platform (KY- DEAP): The DEAP has been developed as an online resource that provides clients with access to the data collection results and the ability to customize their analysis across a range of variables, including industry sector or geographic region. The DEAP is accessed online by authorized users. Users are presented with **dashboards** for businesses and for households. Each dashboard is organized around a series of **pages** focused on specific topics, e.g. Connectivity, Utilization, DEi, Impacts, etc. Within each page is a set of predefined **reports** that present a chart and/or table of processed results from the datasets.

e-Strategies: e-Strategies are high level plans for achieving one or more goals related to improved access to and utilization of broadband Internet. e-Strategies define a course of action that is most likely to successful address opportunities, challenges or barriers related. Strategies are usually seen as distinct from detailed action plans which deal with specific issues of “who, what, when and how”.

e-Solutions: refers to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. e-Solutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

e-Process: uses of the Internet which include internal operational uses, such as supplier coordination, training and teleworking.

e-Commerce: uses of the Internet which include activities related to the sales, marketing and delivery of products and services; and,

Kentucky Digital Economy Index (KY-DEi): The Digital Economy index (DEi) is part of the benchmarking process and provides reference points against which the performance of any individual or group can be compared. The DEi summarizes an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. Based on the number of applications currently being used by an organization or household, a composite score is calculated that summarizes how

comprehensively each organization or household uses Internet-enabled e-solutions. The DEi can be used to compare organizations, regions, or industry sectors.

Utilization refers to the third stage in the broadband development process. The first stage is providing a community, household or organization with access (availability) to the Internet. The second stage is adoption or the process whereby a person or organization starts to actually use the Internet. The third stage is utilization whereby a person or organization uses their Internet connection to create value. Many people and organizations have access and have adopted the Internet, but are relatively ineffective in how they use and derive benefits from the Internet. The field of analysis labeled "utilization" explores patterns of Internet use and how these patterns can be enhanced.

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